

13, lines 8-13, has been amended to add the description of Fig. 1 from the Brief Description of the Drawings. No new matter has been added.

## **II. Double Patenting Rejection**

Claims 1-18, 22-26, 30-36, 61-70 and 86 have been provisionally rejected under 35 U.S.C. Section 101 for allegedly being directed to the same invention as that of claims 1-57 of commonly assigned Application Number 09/738,233 ("the '233 application"). It is respectfully submitted that that is not the case.

The subject matter of the rejected claims of the present application is directed to MRI antennas and MRI systems including antennas comprising an inner conductor substantially surrounded by an outer conductor. As described in claim 1, the inner conductor has first and second ends for being electrically connected across a capacitor to tune the inner conductor to a frequency. The outer conductor also has first and second ends for being electrically connected across a capacitor to tune the outer conductor to the frequency. Certain of the claims recite one or both capacitors. (See claims 3 and 4, for example). The inner and outer conductors define a region for receiving a body part and are inductively coupled during operation. The first and second ends of the inner conductor provide an output of the antenna. The inner and outer conductors are sometimes referred to as coaxial cable units. The inner conductors of a plurality of coaxial cable units may be electrically connected and the outer conductors of a plurality of coaxial cable units may be electrically connected. (See, for example, claims 7-10, 13 and 18, which are dependent on claim 1, and independent claims 30, 37, 41, 54, 61, 75, and 76.). A plurality of inner conductors may be provided

within the outer conductor. (See claims 14-16, which are dependent on claim 1, and independent claim 62, for example). A second outer conductor may be provided around the first outer conductor. (See claim 17, which is dependent on claim 1, and independent claims 70 and 77, for example.). A method of detecting MR signals (claims 78-83), an MRI transmitting antenna (claim 84) and an MRI system including such a transmitting antenna (85) are also provided. Other aspects of the MRI antennas are also claimed.

The subject matter of the claims of the '233 application is also directed to MRI antennas and MRI systems including antennas comprising an inner conductor with first and second ends and an outer conductor with first and second ends, wherein the outer conductor substantially surrounds the inner conductor. However, in contrast to the claims of the present application, the claims of '233 application require that the inner conductor be electrically connected to the outer conductor. The claims of the present application have no such requirement.

The MPEP states that: "In determining whether a statutory basis for a double patenting rejection exists, the question to be asked is: Is the same invention being claimed twice.... 'Same invention' means identical subject matter." (emphasis added) (citations omitted) MPEP Section 804 II. A, page 800-20. As discussed above, the present application claims, in part, electrically connecting the ends of an inner conductor to each other through a capacitor and electrically connecting the ends of an outer conductor to each other through a capacitor. The '233 application claims electrically connecting an inner conductor

to an outer conductor. Identical subject matter is not, therefore, claimed and statutory double patenting does not, therefore, exist. Id.

Furthermore, as discussed above, the present application claims multiple pairs of inner and outer conductors, referred to as coaxial cable units, electrically connected to each other, multiple inner conductors, a second outer conductor surrounding the first outer conductor, methods of receiving MR signals and a transmitting antenna, and other features, which are not claimed in the '233 application. Identical subject matter to these claims is not claimed in the '233 application.

The MPEP continues:

A reliable test for double patenting under 35 U.S.C. 101 is whether a claim in the application could be literally infringed without literally infringing a corresponding claim in the patent. *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970). Is there an embodiment of the invention that falls within the scope of one claim, but not the other. If there is such an embodiment, then identical subject matter is not defined by both claims and statutory double patenting would not exist. (emphasis added). (Id.)

In the embodiments of Figs. 3-8, Figs. 9-12, 20-21, 23-28 and 29-36 of the present application, the inner conductor is not electrically connected to the outer conductor in any coaxial cable unit. None of the claims of the '233 application can therefore be infringed by these embodiments of the present application, while these embodiments would infringe claims of the present application.

In the embodiments of Figs. 3-4, Figs. 7-8b and Figs. 9-10 of the '233 application, the ends of the inner conductors are not connected or connectable across a capacitor and the ends of the outer conductors are not connected or connectable across a capacitor. In addition, in the embodiments of Figs. 7-8b

and Figs. 9-10, an output of the antenna is not provided across the ends of the inner conductor. These embodiments of the '233 application would not, therefore, infringe any claim of the present application, while they would infringe claims of the '233 application. The embodiments of the '233 application would not infringe the claims of the present application reciting multiple coaxial cable units, multiple inner conductors, the second outer conductor surrounding the first outer conductor, the methods of receiving MR signals and other claims, either.

Because of the differences in the claims of the present application and the claims of the '233 application noted above, claims in the present application could be infringed by a particular antenna or MRI system while claims in the '233 application would not, and vice-a-versa. Embodiments of the present application fall within the scope of the claims of the present application and do not fall within the scope of the '233 application and vice-a-versa. According to the test enunciated in the MPEP, identical subject matter is not, therefore, claimed and statutory double patenting does not, therefore, exist. MPEP Section 804 II. A, page 800-20.

Withdrawal of the provisional rejection and reconsideration of the claims are respectfully requested.

It is noted that the Examiner required that the assignee state which entity is the prior inventor of the conflicting subject matter. It is respectfully submitted that the Examiner has not specifically identified the alleged conflicting subject matter and, as discussed above, there is no conflicting subject matter. However, the assignee hereby states that Gregory Eydelman invented the subject matter of

claim 1 before he invented the subject matter of the '233 application. The assignee also states that the subject matter of the present application and the subject matter of the '233 application were commonly owned or subject to assignment to the assignee at all times. If the Examiner requires further information, it is respectfully requested that the alleged conflicting subject matter be more particularly identified.

### III. The Restriction Requirement

Reconsideration of the restriction requirement, which the Examiner made Final, is respectfully requested.

The Examiner asserted that the claims of Group II (original claims 71-77 and 85, drawn to an MRI system) disclose antennas comprising a coaxial cable while the claims of Group I (original claims 1-70 and 84, drawn to an MRI antenna) disclose antennas comprising conductors.

It is respectfully noted that the claims of both Group I and Group II recite coaxial cable units. For example, claims 7, 9, 10, 13, 22-61, 65 and 67 of Group I refer to one or more coaxial cable units. Furthermore, where a coaxial cable unit is recited in the claims of both Groups, it is also recited that the coaxial cable unit comprises an inner conductor surrounded by an outer conductor, which is the same language as is used in the claims that do not recite a coaxial cable unit. (See claims 7, 9 and 22 of Group I and claims 71 and 75 of Group II, for example.). Certain claims of both Groups also recite that an inner conductor and an outer conductor comprise, define or form a coaxial cable unit. (See for example, claims 7, 13, and 30 in Group I and claim 76 of Group II.).

As discussed in the Response to Restriction Requirement and Amendment ("Response") filed on March 7, 2002, the claims of Group I define antennas that are substantially similar to the antennas included in the MRI systems of the claims of Group II. For example, claim 54 of Group I defines an MRI antenna comprising first and second coaxial cable units, each comprising inner and outer conductors. Claim 71 of Group II defines an MRI system including an antenna comprising first and second coaxial cable units comprising inner and outer conductors substantially as described in claim 54, as well. Similarly, the MRI antenna of claim 37 of Group I comprises an antenna comprising three coaxial cable units. The MRI system defined by claim 75 of Group II includes an antenna comprising three coaxial cable units, as well. The MRI antenna defined by claim 61 of Group I comprises first and second inner and outer conductors defining first and second coaxial cable units, respectively. The MRI system of claim 76 of Group II includes an antenna comprising three coaxial cable units, as well. The antenna defined by claim 1 of Group I and the antenna of the MRI system of claim 72 of Group II are defined in terms of inner and outer conductors in substantially the same way as the MRI antenna defined in claim 70 of Group I and the antenna in the MRI system of claim 77 of Group II. The transmitting antenna defined in claim 84 of Group I is substantially similar to the antenna of the MRI system of claim 85 of Group II, both of which are described in terms of inner and outer conductors, as well.

Furthermore, the structure defined by one or more inner conductors surrounded by a respective outer conductor, is similar to a coaxial cable and is

referred to as a coaxial cable unit in the present application. As described in the description on page 13, lines 8- 11:

The unit 10 [see Fig. 1] comprises an inner conductor 12 and an outer conductor 14 coaxially arranged, as shown in the cross-sectional view of Fig. 2. The inner conductor 12 and the outer conductor 14 are separated by a dielectric material 24, such as Teflon®, for example, forming a coaxial cable unit 10.

This description of a coaxial cable unit is consistent with the definition of a coaxial cable in the McGraw Hill DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS, 3<sup>rd</sup> Edition, McGraw Hill Book Company, 1984, p. 317, a copy of which is enclosed. The definition reads: "A transmission line in which one conductor is centered inside and insulated from an outer metal tube that serves as the second conductor." The definition of coaxial cable in the Merriam-Webster's Collegiate Dictionary, Tenth Edition, Merriam-Webster Incorporated, 2001, p. 219, a copy of which is also enclosed, is similar.

It is respectfully submitted that the definition of coaxial cable used by the Examiner in the Office Action is too narrow. A coaxial cable need not, for example, include "a cylindrical shield woven from fine wires". It is further noted that in the claims, the term "coaxial cable unit", not the term "coaxial cable", is used. The inventors may be their own lexicographers and one of ordinary skill in the art would understand that the term "coaxial cable unit" is used in the present application to refer to an inner conductor surrounded by an outer conductor, as claimed.

It is respectfully submitted that since the claims of both Group I and Group II use the terms "coaxial cable unit", the Examiner's basis for requiring restriction

is not correct. Furthermore, since the term "coaxial cable unit" is used in the claims in conjunction with an inner and outer conductor, and the structure defined by the term "coaxial cable unit" as used in the specification and the claims is substantially similar to the structure defined by the inner and outer conductors, a separate search is not required. Withdrawal of the requirement for restriction between Groups I and II is respectfully requested.

#### **IV. The Election Requirement**

The Examiner asserted that the same reasoning supporting the restriction requirement supports the requirement for election between Groups A-F. If by that the Examiner means that claims in some Groups use the term "coaxial cable unit" and claims in other Groups use the terms "inner conductor" and "outer conductor", that is not a proper basis for requiring election. As discussed above, whenever the term "coaxial cable unit" is used in the claims of any Group, it is used in conjunction with the terms "inner conductor" and "outer conductor".

As described in the Response filed March 7, 2002, it is respectfully submitted that Claims 37-40 of Group D, Claims 41-60 of Group E and new Claims 86-88 also read on elected Group A and that a separate search is not required for those Groups. The claims of Group D define an MRI antenna comprising three coaxial cable units with inner conductors electrically connected in a particular manner and outer conductors electrically connected in a particular manner. The claims of Group D read on the embodiment of Figs. 9-12 of the application. The first coaxial cable unit is said to have "a first outer conductor with first and second ends and a first inner conductor with first and second



ends...". The second and third coaxial cable units are similarly described. In claim 1 of Group A, the antenna is said to comprise "an inner conductor with first and second ends" and "an outer conductor with first and second ends." Claim 1 reads on the embodiment of Figs. 9-12, as well as other embodiments. In independent claim 30 of Group A, the antenna is said to comprise a first inner and outer conductor forming a first coaxial cable unit and a second inner and outer conductor forming a second coaxial cable unit. Claim 30 reads on the embodiment of Figs. 9-12, as well as other embodiments. Claim 33, which is dependent on claim 30 and is also part of Group A, adds a third inner and outer conductor forming a third coaxial cable unit, that also reads on the embodiment of Figs. 9-12. Since the claims of Group D are similar to certain of the claims of Group A, and read on embodiments that certain of the claims of Group A also read on, the same search will encompass the claims of both Group A and Group D. The claims of Group D should, therefore, be considered along with the claims of Group A. Claim 1 and Claim 30 of Group A are also generic to the claims of Group D.

The claims of Group E define an MRI antenna comprising two or more coaxial cable units supported by a support in a first plane. The coaxial cable units each comprise respective inner and outer conductors. An MRI antenna as defined by independent Claim 41 and independent Claim 54 of Group E is shown and described with respect to Figs. 13-15, for example. The MRI antenna defined by claim 86, which is dependant on claim 8 and claim 1 (claims 86, 8 and 1 are in Group A), requires that the inner and outer conductors each have two

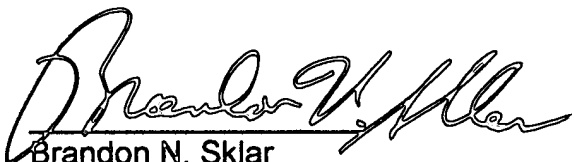
electrically connected sections supported in a same plane by a support, as is also shown and described with respect to Figs. 13-15. Since the claims of Group E are similar to certain of the claims of Group A, and read on embodiments that certain of the claims of Group A also read on, the same search would encompass the claims of both Group A and Group E. The claims of Group E should, therefore, be considered along with the claims of Group A.

While certain of the claims of the Groups have the similarities described above, this is not an admission that those claims or the other claims in the Groups are not patentably distinct.

**V. Conclusion**

Withdrawal of the rejection and restriction/election requirements and reconsideration of the claims are respectfully requested.

Respectfully submitted,

  
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MARKED UP VERSION OF THE AMENDMENTS

In the Specification

The paragraph on page 10, lines 4-5 is being amended to read as follows:

--Fig. 1 is a plan view of a basic coaxial cable unit [10] of an MRI antenna in accordance with one embodiment of the present invention;--

The paragraph on page 13, lines 8-13 is being amended to read as follows:

-- Fig. 1 is a plan view of a basic coaxial cable unit 10 of an MRI antenna in accordance with one embodiment of the present invention. The unit 10 comprises an inner conductor 12 and an outer conductor 14 coaxially arranged, as shown in the cross-sectional view of Fig. 2. The inner conductor 12 and the outer conductor 14 are separated by a dielectric material 24, such as Teflon®, for example, forming a coaxial cable unit 10. The coaxial conductors 12, 14 are inductively coupled to each other. Preferably, the inner and outer conductors 12, 14 are tightly coupled to each other. More preferably, they are critically coupled to each other. --